Alberta Research Council
Open File Report 1965-3

figures

Sucker Creek Indian Reserve

Test Drilling Program

8 - 18 - 74 - 14 - W5

for the Lesser Slave Lake Indian Agency

by

O. Tokarsky

November 1965

Alberta
RESEARCH COUNCIL

SUCKER CREEK INDIAN RESERVE - TEST DRILLING PROGRAM

August 24th - October 2nd, 1965

**Conducted by O. Tokarsky, Groundwater Division,
Research Council of Alberta,
for the Lesser Slave Lake Indian Agency, High Prairie, Alberta.**

Introduction

The Groundwater Division conducted a well survey in the Sucker Creek area during the summer of 1964. The results of this survey were reported in a letter to Mr. J. R. Wild of the Lesser Slave Lake Indian Agency, dated August 11th, 1964. All the chemical analyses had not been received at that time. An up-to-date map showing sampled localities and the iron content of well waters is included with this report (Enclosure #1).

The particular problem at Sucker Creek is the high iron content of the water in shallow wells throughout the Reserve. This is also a problem in the general High Prairie area (where wells at all depths down to over 600 feet are high in iron) and all along the south shore of Lesser Slave Lake. The only continuing source of good potable groundwater is a spring in coarse gravel 4 miles west of Faust and approximately 15 miles east of the Sucker Creek Reserve. Water for household use is hauled from this spring to residents at Sucker Creek, and to farmers in the Enilda area some 10 miles further west.

The town of High Prairie obtains its water supply from a buried channel sand aquifer at a depth of 340 to 390 feet. The water is very high in iron, from 2 to over 5 parts per million (Provincial Analyst), possesses high alkalinity, contains dissolved gases, and has a brownish color. Considerable treatment is required, and even then, all the color is not removed. This aquifer is present at Sucker Creek at a depth of 480 feet.

Three test holes were drilled at Sucker Creek. All encountered aquifers with a high iron content. All were filled in and abandoned. The logs of the test holes and chemical analyses of waters encountered in each are included in the back of this report.

Geology

The surficial geology of the area can be obtained from the Soil Survey map (Research Council of Alberta Rept. #63). Alluvial flood-plain clay and silty clay forms the farm soils. Practically all the wells obtain water from silt or sand phases of the alluvium which is a few tens of feet thick over most of the area. It is believed that all wells on the Sucker Creek Reserve obtain water from these deposits. The alluvial materials contain organic debris and are moderately well drained. It is believed that these two conditions would result in much of the available iron being leached from the soil and carried downwards into the zone of groundwater accumulation, as explained in the next section.

Glacial till underlies the alluvium. It comes to the surface about 3 miles south of Enilda and trends approximately eastward from there to form the heavily wooded higher land south of Sucker Creek Reserve. The till is underlain by a thick sequence of preglacial lacustrine(?) silty clay. This in turn is underlain by preglacial sand which rests on shale bedrock of the Smoky group. The formations in test hole #1 may be interpreted as follows:

0- 38 feet	alluvial silt, sand and clay
38- 90 feet	glacial till with sandy lenses
90-480 feet	preglacial lacustrine(?) silty clay
480-485 feet	preglacial sand.

The Faust spring emerges from preglacial gravels exposed at the surface over an area of approximately 1 square mile.

The Wapiti Formation, a sandstone-shale sequence which would be expected to contain aquifers yielding potable water forms the bedrock (beneath a thin drift cover) from about 3 miles south of Sucker Creek Reserve southwards.

The Wapiti Formation is underlain by the Smoky Group, which is predominately shale, but includes the Bedheart Sandstone. The Bedheart Sandstone was an objective in test hole #1 where it was expected to be encountered at approximately 430 feet. This formation has, however, been removed at this location, by proglacial erosion.

Well Survey Results and Groundwater Chemistry

The U.S. Public Health Service recommends a limit of 0.3 parts per million of iron in water for domestic use. This limit is set, not on the basis of toxicity, but on esthetic and taste considerations. People, and livestock as well, are sensitive to the taste of iron in water. Amounts in excess of this limit will stain plumbing fixtures, cooking utensils and laundry.

In the area under consideration from Enilda to Jousard (enclosure #1), only three small regions can be outlined which have iron concentrations in the groundwater of less than 1.0 part per million. All are outside the limits of the reserve. In addition, a few individual wells, some of these within the reserve, have concentrations of less than 0.3 parts per million.

It is believed that in most cases the relatively low iron concentrations can be attributed to one of two factors:

(1) In unused or little used wells, iron-bearing groundwaters are in contact with the air for extended periods. Oxidation of iron from the soluble ferrous state to the less soluble ferric state will occur. The iron will precipitate out and settle downwards in the water. Some of this iron will in all likelihood be redissolved as it moves downward into less oxidizing conditions. A water sample collected from the surface, or very near the surface, of the water in the well could be low in iron content

for some time, usually an hour. The rate at which the water level rises gives a rough idea of the yield to be expected. On this basis, the two most promising aquifers are:

(1) sand at 480-485 feet in test hole #1

(2) sand at 20-25 feet in test hole #3.

The sand aquifer in test hole #3 was bailed for 50 minutes at approximately 25 gallons per minute and drew down 9.8 feet. There was 11 feet of available drawdown.

Bailing in test hole #1 was at 14 gallons per minute for 1/2 hour. Drawdown was not measured. There was 471 feet of available drawdown.

Conclusions and Recommendations

Two aquifers were encountered which would probably be able to supply sufficient water for community use, a shallow sand in test hole #3 and a deep sand in test hole #1. Both were too high in iron to be useable without treatment.

The results of the well survey indicate that all groundwaters in the immediate vicinity of the reserve are high in iron. The area south of the reserve is heavily forested and generally inaccessible. It is believed that opportunities for more favorable supplies do exist in this area where the underlying bedrock consists of Wapiti sandstones and shales (i.e. 3 miles or more south of the reserve). The only other known source of available potable groundwater is the Faust spring 15 miles to the east, from which water is hauled to the reserve at the present time. Treatment of water with a high iron content in a well at Driftpile, 12 miles east of the Sucker Creek Reserve, has been attempted but has not proved satisfactory.

I would recommend that hauling of water from the Faust spring be continued. Drilling to the south of the reserve could be considered, although even if a favorable

supply were located, hauling would still be necessary. A solution, which I believe some of the personnel at the Lesser Slave Lake Indian Agency favor, is the installation of a water reservoir and purification system on Sucker Creek, similar to that at Kinuso. Some of the Indians I have talked to on the reserve favor the installation of cisterns at each house and the purchase of a water truck for continued hauling of water from the Faust spring. Both solutions have merit and should be considered on the basis of economics, convenience, and long-term use.

The cost of construction of the earth reservoir at Kinuso was in the order of $75,000. The reservoir stores 6-months supply for about 400 people. Treatment includes flocculation, filtration, aeration, and chlorination. There is no problem with iron. The reservoir stores water from Swan River. If a similar reservoir is considered for the Sucker Creek Reserve, the source of water would probably be Sucker Creek or Arcadia Creek. This water is organically colored. A water sample taken from Arcadia Creek in June 1964 had only a trace of iron. It is not known if the iron content would increase during different times of the year.

S. [illegible]
[illegible], 1965

LOGS OF TEST HOLES AND CHEMICAL ANALYSES OF AQUIFERS

Sucker Creek Indian Reserve Test Hole #1

Approximate location and elevation: Approx. Lsd. 8, Sec. 18, Tp. 74, R. 14, W. 5 Mer.

Drilled by church in Eddie Callio's yard, about 200 feet south of house. 1915 feet estimated elevation.

0- 10	yellowish clayey sand, fine to medium grained. Water from 5 feet (water table). Water high in iron, over 7 ppm. Water sample #1.
10- 20	dark grey clayey sandy silt
20- 35	clayey silt mixed with silty clay; sand stringers
35- 38	coarse pebbly sand. Water sample #2. High in iron- 4ppm
38- 75	till, not very stony, dark grey
75- 78	clayey sand, very fine to fine grained; very little water
78- 90	grey till, few stones
90- 95	poorly sorted bentonitic sand; very little water. Sample #3 Iron 0.6 ppm
95-120	smooth grey clay, silty
120-135	smooth grey clay, slightly to non-silty
135-155	smooth grey clay, silty
155-190	smooth grey clay, very silty; gas at 160 feet
190-275	smooth grey clay, silty; gas at 210 feet
275-305	smooth grey clay, slightly silty
305-450	smooth grey clay, non-silty; gas at 365 feet
450-465	smooth grey clay, silty; gas at 450 feet
465-480	smooth grey clay, non-silty
480-485 (T.D.)	fine-grained sand. Water sample #4 Iron over 10 ppm. Gas in water and oil scum on water Bailed hole for 1 hour 15 minutes. Took another water sample (#5) Iron 10 ppm

Test Hole #2

Approximate location and elevation: Approx. Lsd. 5, Sec. 17, Tp. 74, R. 14, W. 5 Mer. 1915 feet estimated elevation.

Drilled approximately 100 yards west of house of Marilia Willier.

0- 15	brownish sand, fine to medium grained. Water from 6 feet (water table). Water sample #1. Iron over 10 ppm and highly colored.
15- 19	grey sand, fine to medium grained, somewhat clayey
19- 37	dark grey till, few stones
37- 42	fine grained clean white sand. Not much water. Water sample #2 Iron 2 ppm.
42- 70	till, few stones
70-100 (T.D.)	Smooth grey clay, silty.

Test Hole #3 - Approx. location: Lsd. 13, Sec. 8, Tp. 74, R. 14, W. 5 Mer.
Elevation estimated at 1918 feet.

0- 5	soil profile
5- 15	brownish, poorly sorted sand, fine to medium grained, clayey
15- 20	dark grey sand, otherwise as above
20- 25	poorly sorted sand, some fine gravel. Water sample #1. Iron 3 ppm. Put in slotted casing. Bailed for 1 hour at about 25 gpm. Water sample #2 taken after bailing. Field test for iron - Iron still high.
25- 30	dark grey till, few stones
30- 45	smooth grey clay, silty
45- 50	fine clayey silt
50- 60 (T.D.)	smooth grey clay, very silty

C. EMERSON NOBLE
CHEMICAL ENGINEER
DIRECTOR INDUSTRIAL LABORATORIES
PROVINCIAL ANALYST

EDMONTON, ALBERTA
CANADA

WATER ANALYSIS REPORT
CHEMICAL

Submitted by ..... Research Council .....

Address .....

.....

Container No. ..... OT 001-2 .....
Sinclair Creek Test hole #2
0-15'

Date received ..... October 1, 1965 .....

Date reported ..... October 21, 1965 .....

Source of Sample .....

Serial No. .....

Lab. No. ..... 65 - 11864 .....

PARTS PER MILLION

Total Solids	336	Carbonate	nil
Ignition Loss	124	Bicarbonate	201.3
Hardness	160	Calcium	44
Sulphates	60	Magnesium	12.2
Chlorides	11	Sodium	37.2
Alkalinity	165	Potassium	11.5
Nature of Alkalinity	Bicarbonate of lime, magnesium and trace soda		
Nitrite Nitrogen	nil		
Nitrate Nitrogen	nil		
Iron	10+ Field test for iron not attempted. (Water is highly colored)		
Fluorine			

REMARKS:

pH -- 7.3

C. Emerson Noble
Provincial Analyst

CEN: pm

C. EMERSON NOBLE
CHEMICAL ENGINEER
DIRECTOR INDUSTRIAL LABORATORIES
PROVINCIAL ANALYST

UNIVERSITY OF ALBERTA
QUAECUMQUE VERA

EDMONTON, ALBERTA
CANADA

WATER ANALYSIS REPORT
CHEMICAL

omitted by Research Council — Date received October 1, 1965

ess — Date reported October 21, 1965

Source of Sample

iner No. OT 007-2 — Serial No.

Sucker Creek test hole #3
20-25'
After ½ hour of bailing to develop.

Lab. No. 65 - 11859

PARTS PER MILLION

Solids	386	Carbonate	
ition Loss	74	Bicarbonate	
ness	220	Calcium	49.2
ates	119	Magnesium	23.5
orides	nil	Sodium	56.9
nity	210	Potassium	10.5
ure of Alkalinity	Bicarbonate of lime and magnesium		
e Nitrogen	nil		
e Nitrogen	nil		
	3. Fill test for iron (Hach kit) 5+ ppm - bothered by turbidity / color in water.		
ne			

MARKS:

pH -- 8.0

C. Emerson Noble
Provincial Analyst

CEN:pm

C. EMERSON NOBLE
CHEMICAL ENGINEER
DIRECTOR INDUSTRIAL LABORATORIES
PROVINCIAL ANALYST

EDMONTON, ALBERTA
CANADA

WATER ANALYSIS REPORT
CHEMICAL

ubmitted by ..... Research Council ..... Date received ..... October 1, 1965 .....

dress ..... Date reported ..... October 21, 1965 .....

..... Source of Sample .....

ontainer No. ..... OT 009-2 ..... Serial No. .....

Sucker Creek test hole #3
20-25'
After 50 mins. bailing at 15 to 15 gpm.

Lab. No. ..... 65 - 11861 .....

	PARTS PER MILLION		
al Solids	378	Carbonate	
nition Loss	76	Bicarbonate	
ardness	185	Calcium	44.0
phates	95	Magnesium	18.2
hlorides	nil	Sodium	69.9
alinity	225	Potassium	4.6
ture of Alkalinity	Bicarbonate of lime, magnesium and soda		
itrite Nitrogen	nil		
rate Nitrogen	nil		
ron	nil Field test for iron (Hach Kit) 5+ ppm – bothered by turbidity & color in water.		
orine			

MARKS:

pH -- 8.3

C. E. Noble
C. Emerson Noble
Provincial Analyst

CEN:pm

SUCKER CREEK RESERVE - CHEMICAL ANALYSES

- July 23/64

Results of analysis of twenty-seven samples of water from Sucker Creek Reserve for color, iron, magnesium, calcium, sodium & chloride.

Sample Number	SOURCE Name	Station	Color (Units)	Iron (Fe) (Total) P.P.M.	Magnesium (Mg) P.P.M.	Calcium (Ca) P.P.M.	Sodium (Na) P.P.M.	Chloride (Cl) P.P.M.
	Tommy Willier	73	30.0	0.5	8.7	29.6	8.0	5.0
	Charlie Woods	75	40.0	36.0	22.8	80.7	17.0	26.0
	Charlie Woods	75-B	40.0	36.0	22.8	76.5	18.0	26.0
	Joe Badger	76-1	5.0	0.6	22.8	63.5	11.0	2.0
	Joe Badger	76-2	130.0	16.0	12.3	42.0	7.0	2.0
	Joe Badger	76-3	40.0	0.2	24.2	91.0	12.0	53.0
	Frank Cardinal	77-1	30.0	20.0	16.8	63.2	7.0	2.0
	Frank Cardinal	77-2	10.0	0.7	9.6	22.2	3.0	2.0
	Jim Willier	78-1	5.0	14.0	31.5	84.0	17.0	17.0
	Jim Willier	78-2	30.0	2.4	22.4	56.8	11.0	21.0
	Scotty Willier	79-1	40.0	12.0	12.8	49.5	13.0	3.0
	Scotty Willier	79-2	50.0	7.2	50.8	169.0	31.0	101.0
	Joe Willier	80	40.0	1.4	12.3	44.5	10.0	3.0
	Jeremy Gautier	81	15.0	1.8	16.0	40.4	16.0	2.0
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

C. EMERSON NOBLE
CHEMICAL ENGINEER
DIRECTOR INDUSTRIAL LABORATORIES
PROVINCIAL ANALYST

EDMONTON, ALBERTA
CANADA

WATER ANALYSIS REPORT
CHEMICAL

Submitted by Research Council — Date received October 1, 1965

Address — Date reported October 21, 1965

Source of Sample

Container No. OT 006-2 — Serial No.

Marilla Wilmer - bored well

Lab. No. 65 - 11863

PARTS PER MILLION

Total Solids	416	Carbonate	nil
Ignition Loss	176	Bicarbonate	366
Hardness	325	Calcium	74.1
Sulphates	26.5	Magnesium	34.0
Chlorides	7	Sodium	18.9
Alkalinity	300	Potassium	0.8
Nature of Alkalinity	Bicarbonate of lime and magnesium		
Nitrite Nitrogen	nil		
Nitrate Nitrogen	nil		
Iron	25+ Hach kit test for iron not attempted.		
Fluorine			

REMARKS:

pH -- 7.0

C. Emerson Noble
Provincial Analyst

CEN:pm

C. EMERSON NOBLE
Provincial Analyst

UNIVERSITY OF ALBERTA
QUALCUMQUE VERA

EDMONTON, ALBERTA
CANADA

WATER ANALYSIS REPORT
CHEMICAL

ubmitted by ..... O. Tokarsky ..... Date received ..... July 6, 1964

ress ..... Research Council ..... Date reported ..... July 9, 1964

..... Source of Sample ..... Stn # 42, Enilda Arcola Creek - at bridge on Hwy 22

tainer No. ..... Serial No. .....

Lab. No. ..... 64 - 7987

PARTS PER MILLION

l Solids	224
nition Loss	134
lness	80
lphates	22
lorides	nil
linity	85
ature of Alkalinity	Bicarbonate of lime, magnesium and soda
tes	nil
trates	nil
n	trace
rine	

EMARKS:

Water is chemically suitable.

C. Emerson Noble
Provincial Analyst

CEN:pm

C. EMERSON NOBLE
CHEMICAL ENGINEER
DIRECTOR INDUSTRIAL LABORATORIES
PROVINCIAL ANALYST

EDMONTON, ALBERTA
CANADA

WATER ANALYSIS REPORT
CHEMICAL

...ited by	O. Tokarsky	Date received	August 17, 1964
...	Research Council	Date reported	August 21, 1964
		Source of Sample	
...er No.	Stn. 4-B	Serial No.	
		Lab. No.	64 - 10115

PARTS PER MILLION

...olids	176
...on Loss	110
... ...s	80
...ates	11
...ides	9
... ...ty	55
...e of Alkalinity	Bicarbonate of lime and magnesium
...e Nitrogen	nil
...e Nitrogen	nil
	4

...ARKS:

Ca -- 16.2

Mg -- 9.6

Ca/Mg = 1.69/1

1.69
9.6 | 16.2
9.6
66
60
6

C. Emerson Noble
Provincial Analyst

CEN:pm

C. EMERSON NOBLE
CHEMICAL ENGINEER
DIRECTOR INDUSTRIAL LABORATORIES
PROVINCIAL ANALYST

EDMONTON, ALBERTA
CANADA

WATER ANALYSIS REPORT
CHEMICAL

nitted by O. Tokarsky — Date received August 17, 1964

s Research Council — Date reported August 21, 1964

Source of Sample Leo Heisz

er No. Stn. 1-B — Serial No.

Lab. No. 64 - 10114

PARTS PER MILLION

	May/64	
olids	1052	688
ion Loss	256	284
ess	20?	420
tes	215	56
rides	46	71
nity	355	335
re of Alkalinity	bicarb. of soda.	
Nitrogen	nil	trace
Nitrogen	nil	2.0
	5+	4

ne

ARKS:

Ca -- 115.4 Ca : Mg = 3.62 : 1

Mg -- 31.9

3.61
319 | 1154.
957
1970
1914
560
319

C. Emerson Noble
Provincial Analyst

CEN:pm

C. EMERSON NOBLE
CHEMICAL ENGINEER
DIRECTOR INDUSTRIAL LABORATORIES
PROVINCIAL ANALYST

EDMONTON, ALBERTA
CANADA

WATER ANALYSIS REPORT
CHEMICAL

itted by O. Tokarsky

s Research Council

Date received May 15, 1964

Date reported May 22, 1964

Source of Sample Enilda, Alberta
8-16-74-15 W5

ıber No. Stn. # 3

Serial No.

Lab. No. 64 - 5776

PARTS PER MILLION

olids	732
on Loss	130
ess	120
es	263
ides	10
ty	170
e of Alkalinity	Bicarbonate of soda, lime and magnesium
es	nil
	nil
	10.0

RKS:

Water is chemically suitable when Iron settles.

C. Emerson Noble
Provincial Analyst

CEN:pl

C. EMERSON NOBLE
CHEMICAL ENGINEER
DIRECTOR INDUSTRIAL LABORATORIES
PROVINCIAL ANALYST

UNIVERSITY OF ALBERTA
QUAECUMQUE VERA

EDMONTON, ALBERTA
CANADA

WATER ANALYSIS REPORT
CHEMICAL

nitted by ..... O. Tokarsky ..... Date received ..... August 17, 1964 .....

is ..... Research Council ..... Date reported ..... August 21, 1964 .....

..... Source of Sample ..... Howard Peever .....

ner No. ..... Stn. 5-B ..... Serial No. .....

Lab. No. ..... 64 - 10116 .....

PARTS PER MILLION

	May/64	
Solids	512	528
lion Loss	122	184
ess	25	300
ates	271	200
orides	nil	2
nity	50	155
ure of Alkalinity		Bicarbonate of lime and magnesium
Nitrogen	tr.	nil
e Nitrogen	1.5	nil
	tr	3.0
ne		

MARKS:

Ca -- 80.8 Ca:Mg = 3.39:1

Mg -- 23.8

3.394

CEN:pm

C. Emerson Noble
Provincial Analyst

C. EMERSON NOBLE
CHEMICAL ENGINEER
DIRECTOR INDUSTRIAL LABORATORIES
PROVINCIAL ANALYST

UNIVERSITY OF ALBERTA
QUAECUMQUE VERA

EDMONTON, ALBERTA
CANADA

WATER ANALYSIS REPORT
CHEMICAL

ed by	O. Tokarsky	Date received	August 17, 1964
	Research Council	Date reported	August 21, 1964
		Source of Sample	
... No.	Stn. 6-B	Serial No.	
		Lab. No.	64 - 10118

PARTS PER MILLION

...ls	266
Loss	110
s	150
...	67
es	2
...	60
of Alkalinity	Bicarbonate of lime and magnesium
N..trogen	nil
..trogen	nil
	3.0
e	

RKS:

Ca -- 38.1 Ca/Mg = 2.86/1

Mg -- 13.3

CEN:pm

C. Emerson Noble
Provincial Analyst

C. EMERSON NOBLE
CHEMICAL ENGINEER
DIRECTOR INDUSTRIAL LABORATORIES
PROVINCIAL ANALYST

EDMONTON, ALBERTA
CANADA

WATER ANALYSIS REPORT
CHEMICAL

itted by O. Tokarsky — Date received June 15, 1964

dress — Date reported June 17, 1964

— Source of Sample Stn. #27, J. Jacobs, Enilda

ainer No. — Serial No.

Lab. No. 64 - 7024

PARTS PER MILLION

al Solids	730
...on Loss	248
ness	485
phates	158
·ides	3
alinity	350
ture of Alkalinity	Bicarbonate of lime and magnesium
es	trace
rates	0.3
	0.7
orine	

MARKS:

Water is chemically suitable.

C. Emerson Noble
Provincial ANalyst

CEN:as

C. EMERSON NOBLE
CHEMICAL ENGINEER
DIRECTOR INDUSTRIAL LABORATORIES
PROVINCIAL ANALYST

EDMONTON, ALBERTA
CANADA

WATER ANALYSIS REPORT
CHEMICAL

mitted by O. Tokarsky — Date received July 6, 1964

ss Research Conncil — Date reported July 9, 1964

Source of Sample Stn # 43, Faust, Alberta

tainer No. — Serial No. Faust (Spring)

Lab. No. 64 - 7988

Federal Analysis
T.P. - Dec. 1955

PARTS PER MILLION

Solids	183 (184) 192 (calc.)	184
tion Loss	11	44
dness	81	75
ites	7	10
rides	2.5	nil
nity	131 as $CaCO_3$	150
of Alkalinity		Bicarbonate of soda, lime and magnesium
ites	0.018	nil
s	1.4	nil
	nil	0.2
ne		

RKS:

Water is chemically suitable.

C. Emerson Noble
Provincial Analyst

CEN:pm

C. EMERSON NOBLE
CHEMICAL ENGINEER
DIRECTOR INDUSTRIAL LABORATORIES
PROVINCIAL ANALYST

UNIVERSITY OF ALBERTA

EDMONTON, ALBERTA
CANADA

WATER ANALYSIS REPORT
CHEMICAL

...mitted by O. Tokarsky

...ss Research Council

...ner No. Stn. 74-1

Date received August 17, 1964

Date reported August 21, 1964

Source of Sample N. Austad
with by house

Serial No. —

Lab. No. 64 - 10107

PARTS PER MILLION

... Solids	274
...tion Loss	108
...ness	240
...phates	71
...rides	nil
...nity	225
...ure of Alkalinity	Bicarbonate of lime and magnesium
... Nitrogen	nil
...te Nitrogen	nil
	2.0
...ne	

...MARKS:

Ca -- 64.6 Ca : Mg = 3.40 : 1

Mg -- 19.0

3.4
19 / 64.6
57
76
76

C. Emerson Noble
Provincial Analyst

CEN:pm

C. EMERSON NOBLE
CHEMICAL ENGINEER
DIRECTOR INDUSTRIAL LABORATORIES
PROVINCIAL ANALYST

EDMONTON, ALBERTA
CANADA

WATER ANALYSIS REPORT
CHEMICAL

bmitted by ..... O. Tokarsky .....

ress ..... Research Council .....

.....

ntainer No. ..... Stn. 74-2 .....

Date received ..... August 17, 1964 .....

Date reported ..... August 21, 1964 .....

Source of Sample ..... N. Austad .....
will by Lam - muscle.

Serial No. .....

Lab. No. ..... 64 - 10108 .....

PARTS PER MILLION

l Solids	352
nition Loss	140
dness	305
hates	28
lorides	5
linity	275
ture of Alkalinity	Bicarbonate of lime and magnesium
rite Nitrogen	nil
ate Nitrogen	nil
on	2.0
rine	

MARKS:

Ca. -- 78.5 Ca : Mg = 2.97 : 1

Mg -- 26.4

2.97
264) 785.
528
2570
2376
1940
1848
92

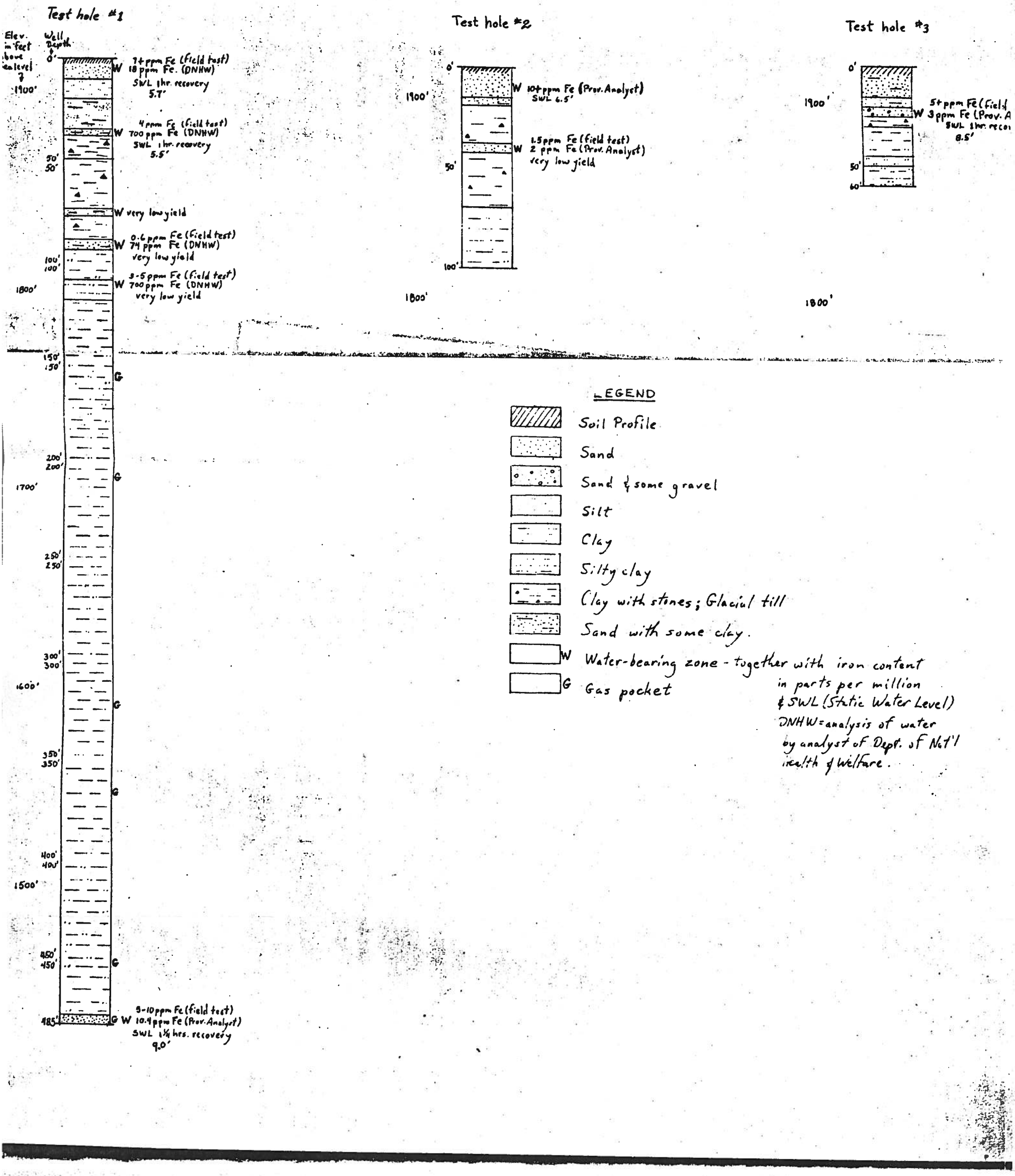
C. Emerson Noble
Provincial Analyst

CEN:pm

ENCLOSURE

Encl. #2

Sucker Creek Indian Reserve test drilling, 1965



LEGEND

- Soil Profile
- Sand
- Sand & some gravel
- Silt
- Clay
- Silty clay
- Clay with stones; Glacial till
- Sand with some clay.
- W Water-bearing zone - together with iron content in parts per million & SWL (Static Water Level)
- G Gas pocket

DNHW = analysis of water by analyst of Dept. of Nat'l Health & Welfare.